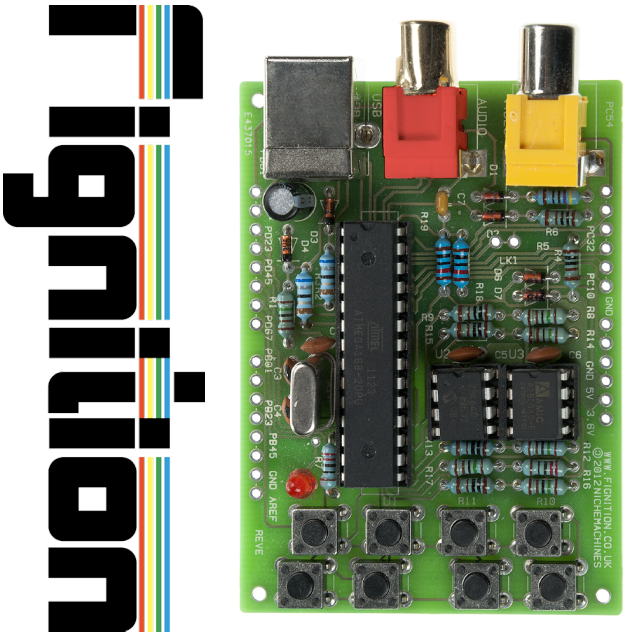
START HERE :
Welcome to FIGnition inFUZE, the DIY 8-bit computer from nichemachines™ brought to you by RS Components. This guide shows you what you'll need, what's in the kit; how to solder it together and how to use the keypad.
It will take you about 1 to 3 hours! Enjoy!



**KIT CONTENTS**

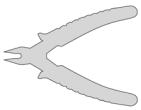
**1. Major components mounted on antistatic foam:**
- **A 28-pin socket and two 8-pin sockets**
- **A 28-pin AVR Microcontroller**
- **An 8-pin Microchip Serial RAM**
- **An 8-bit Amic Serial Flash chip.**
- **Eight Switches**
- **Two phono sockets and a USB-B socket.**
- **The FIGnition PCB.**

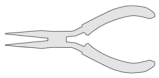
**2. An antistatic bag containing the remaining components:**
- **Four 1N4148 Diodes with "4148" on package.**
- **Two 3V6 Zener Diodes with "3V6" on package.**
- **One LED**
- **Six 1K5 Resistors, R1, R8, R10, R12, R14, R17 like:** 
- **Six 1K Resistors, R4, R5, R9, R11, R13, R15 like:** 
- **Two 220R Resistors, R7 and R16 like:** 
- **Two 68R Resistors, R2 and R3 like:** 
- **Two 10K Resistors, R18 and R19 like:** 
- **One 470R Resistor, R6 like:** 
- **Three 10nF Capacitors (Orange disc saying "103")**
- **Two 22pF Capacitors (Orange disc topped with black blob)**
- **A 100nF Capacitor (A blobby disc saying "104")**
- **A 4.7µF Capacitor (Tall black cylinder)**
- **A 20MHz Oscillator (Flattish, rounded, shiny can)**

TOOLS NEEDED:


Small flat-head screwdriver
RS No. 201-0009


Soldering iron (with sponge)
RS No. 768-3573 (UK) / 768-3576 (EU)


Clippers
RS No. 201-0009


Fine-tipped pliers
RS No. 201-0009


Solder

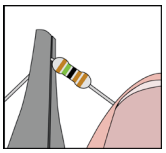

Solder sucker
RS No. 771-9543

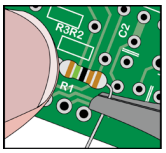

Multimeter
RS No. 697-4061.

CABLES NEEDED:

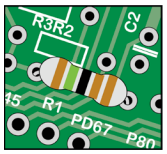
- A phono to phono lead (or to SCART)
  RS No. 410-905
- A USB cable with a standard B connector
  RS No. 411-176 (0.8m) / 433-0917 (3m)
- USB mobile phone charger (or other USB power source)
- A PAL TV with composite video or SCART inputs

SOLDERING GUIDE - (For info on using the solder sucker and a more in depth tutorial, go to http://www.kpsec.freeuk.com/solder.htm. )
Damp the sponge. Place the soldering iron in its holder and switch it on (to three-quarters, if it's temperature controlled). **Hold the soldering iron and 'tin' the tip by melting some solder onto it, then wipe excess on the sponge. Now find R1, a 1K5 resistor, we'll solder that one first.**

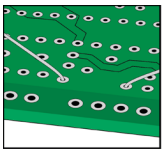

1. Bend one end of the wire at right-angles using pliers really close to the component,

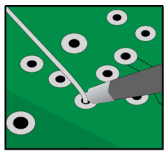


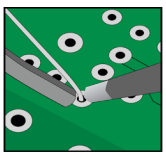
2. Place in its hole, see where the other side should be bent and bend the wire with the pliers at that point.

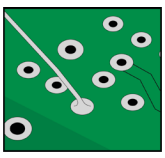


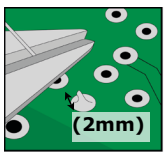
3. Place the component in its location on the topside of the PCB.


4. Turn the PCB over and splay the legs out at about 45º.


**5. Hold the iron so the tip touches both the component's leg and its solder pad; then wait for 2 to 3 seconds.**


6. Apply (with a little pressure), the solder at the place where the component leg, the solder pad and the tip of the iron meet.


7. Wait until solder melts & slides up leg / onto pad. Remove solder wire, then the iron. A few seconds later it will solidify.



8. Snip the leg off the component and visually check that the solder joints look good - use a magnifying glass if you need to.

## BUILD INSTRUCTIONS

Look at the PCB on the right. Components are blocked in different colours in the order you should solder them and there are notes for each block as follows:

**1. RESISTORS - Here you need to match the colours of the bands for each resistor. If you're colour blind, use a multimeter to measure each resistor; then find match it to a resistor in the Kit contents and then find a resistor with that label on the PCB.**

2. DIODES
- Make sure the black stripes are at the same end as on the PCB diagram.
- Start with D3 and D4 which are marked '3v6' and have clipped legs.

3. SWITCHES
- These are slightly wider than long and pop into position (you don't need to splay the legs).

4. CAPACITORS
- The two caps marked '22' and have black blobs go in C3 and C4. The short legged one goes in C7. The rest go in C2, C5 and C6.

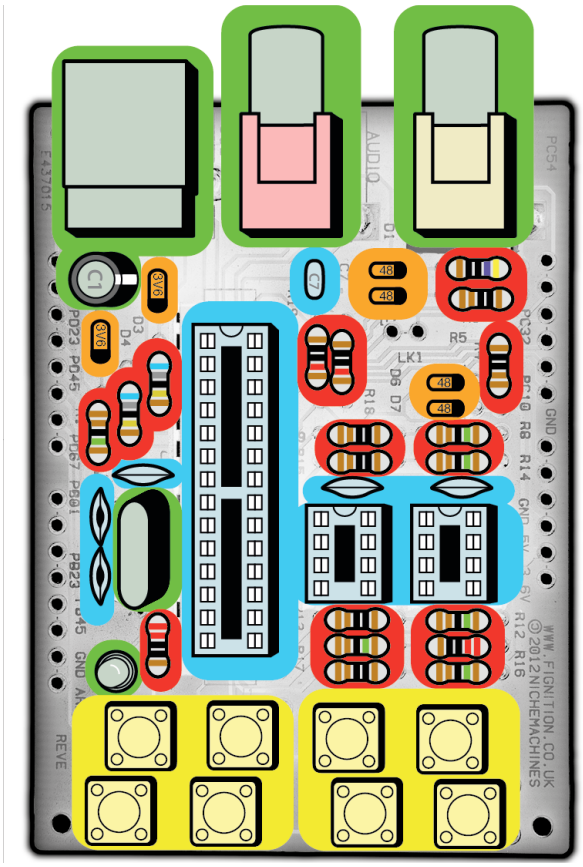
5a. IC SOCKETS.
- Fit each one into its holes and hold it while you turn it upside down. Slide it all onto the worktop. Solder the opposite two corner legs of the socket first; then it won't fall out when you solder the rest.

b. LED
- The longer leg should go on the same side as R7

c. CAPACITOR C1
- Very important: the white stripe should go as shown in the PCB diagram.

d. PHONO SOCKETS and USB
- You will need quite a bit of solder for the anchoring points and it's harder to melt, be patient.

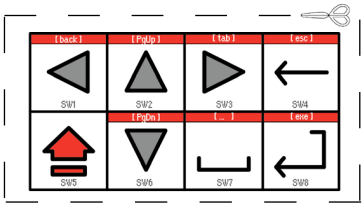

6. TESTING
- First, take a break of about 20 minutes!
- Then carefully follow the online instructions at: http://www.fignition.co.uk/fuze/testing.




### KEYPAD GUIDE

FIGnition's crazy keypad is easy to learn.

- Cut out the keypad overlay and stick it across the phono sockets.




- Turn on your FIGnition and wait for the blinking cursor.

- Tap ⎵ and FIGnition should type a space (the other single keys move the cursor, delete characters, switch to capitals and back or enter a new line).

- Hold down ▶ (cursor right). After a short pause you should see:


- If you now tap ◀ (cursor left), an a should appear. Try holding different keys to see what else you can type and then make FIGnition display exactly:


- Now you need to execute it by typing <exe>. If you tap ⏏ (Shift), then tap ↵ (Enter), FIGnition should display it followed by "OK"!

### NEXT STEPS

Building a FIGnition computer is just the beginning! Explore the bundled programs on FIGnition at: http://www.fignition.co.uk/bundle. Learn to program FIGnition at: http://www.fignition.co.uk/fuze/tutorial and http://www.fignition.co.uk/fuze/usermanual. Find out how all the hardware works at: http://www.fignition.co.uk/fuze/hardware !

At all times, remember: FIGnition is a computer every bit as real as your laptop or tablet, but only containing the bare essentials. It's built-in language; video, USB, memory and keypad firmware is contained in around 8000 instructions and it is expandable too. It's the only computer available today, simple enough to be built from scratch, then coded and understood.

CREDITS. FIGnition, the Open-Source Firmware and OSH Compliant DIY 8-bit computer. Design, nichemachines™.
inFUZE brought to you by RS Components http://uk.rs-online.com .
FIGnition Logo designed by Mr Gonaka http://www.mrgonaka.co.uk. Leaflet Design by Sam Rees.